SECTION 6A
ROADWAY PLAN PREPARATION

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SECTION 6A
ROADWAY PLAN PREPARATION

6A.1 GENERAL

The following are guidelines for the preparation of contract plans. These instructions are intended to insure that uniform level of engineering (design) information is presented and arranged in a consistent format. Plans will be reviewed by the Authority at various interim stages of completion as discussed below.

Plans shall contain all essential and other required data presented in a manner consistent with good engineering practice. The amount of detail included shall be that necessary and sufficient to allow a bidder to quickly and properly assess and evaluate the work to be done.

All final contract plans shall be prepared on mylar material 0.003 inch to 0.004 inch thick. The overall sheet size, edge-to-edge, shall be 22 inches x 36 inches and shall be 21 inches x 33 ½ inches inside of borders as detailed in Exhibit 6A - 1.

The title box shall be in the lower right hand corner of the sheet and shall be of the size shown in Exhibit 6A - 1. The wording in the title box shall be as shown in Exhibit 6A - 2 depending upon the particular project involved. The name of the roadway shall be the road on which the work is being performed.

On all plan sheets, except where noted otherwise in this Manual, the minimum size lettering to be used shall have a base height of equal to 0.12 feet. As the plans may be reduced to half size, this is the minimum size lettering which will produce a clear, legible text after reduction. Similarly a bar scale should appear on all sheets where a reduction in sheet size will affect the scale of the drawing.

Symbols and line weights shall be as shown in the Standard Legend in the Sample Plans. In the preparation of plans, the use of drafting aides, such as tape or rub-ons, will not be allowed. The Authority will not accept as an original tracing any sheet with aids attached to it. Nor will the Authority accept any sheet that is poorly reproduced.

Reference is made to the Sample Plans as a supplement to contract plan sheet content and format that is described in this Manual.

EXHIBIT 6A - 1
TYPICAL SHEET LAYOUT

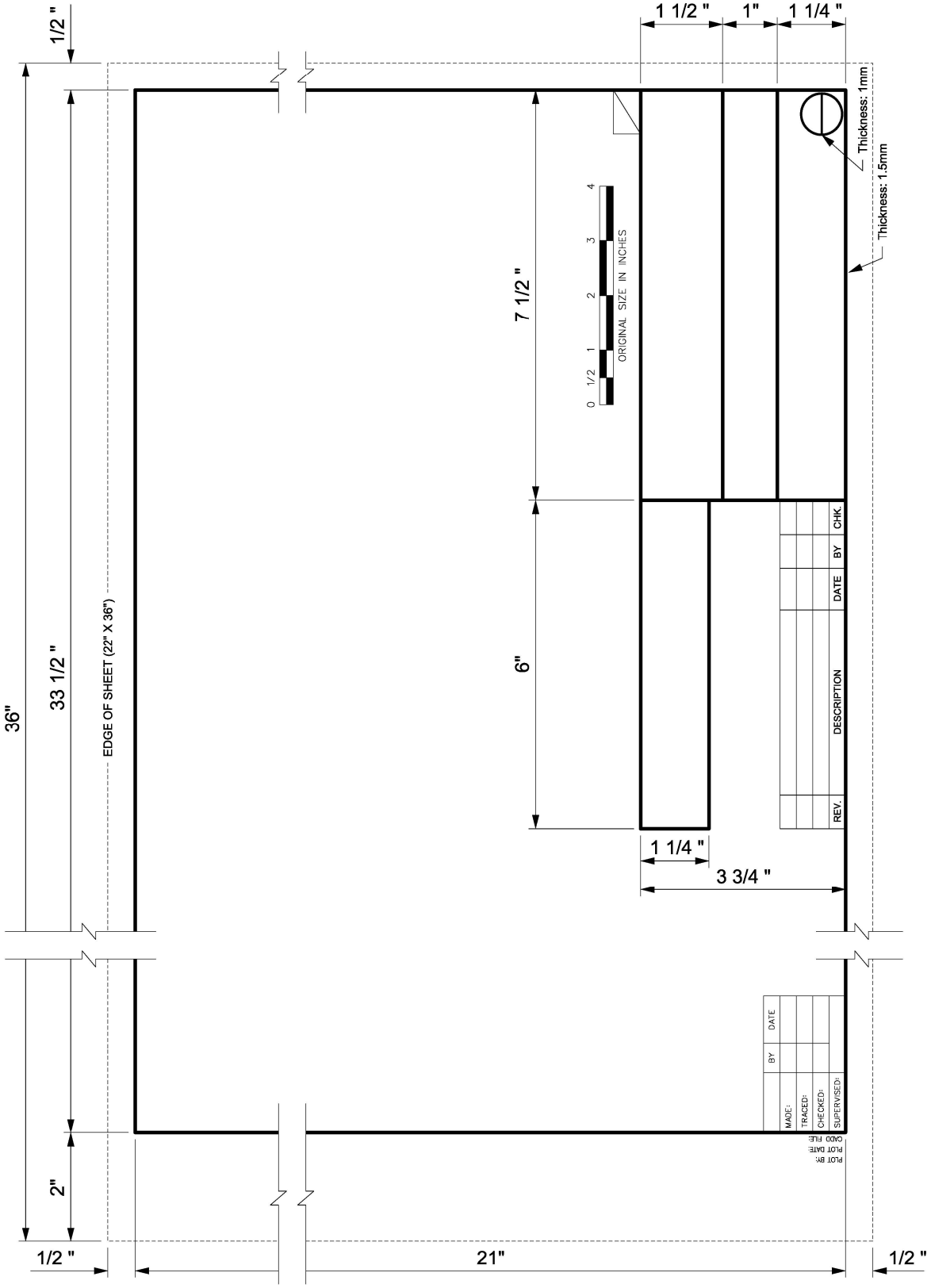
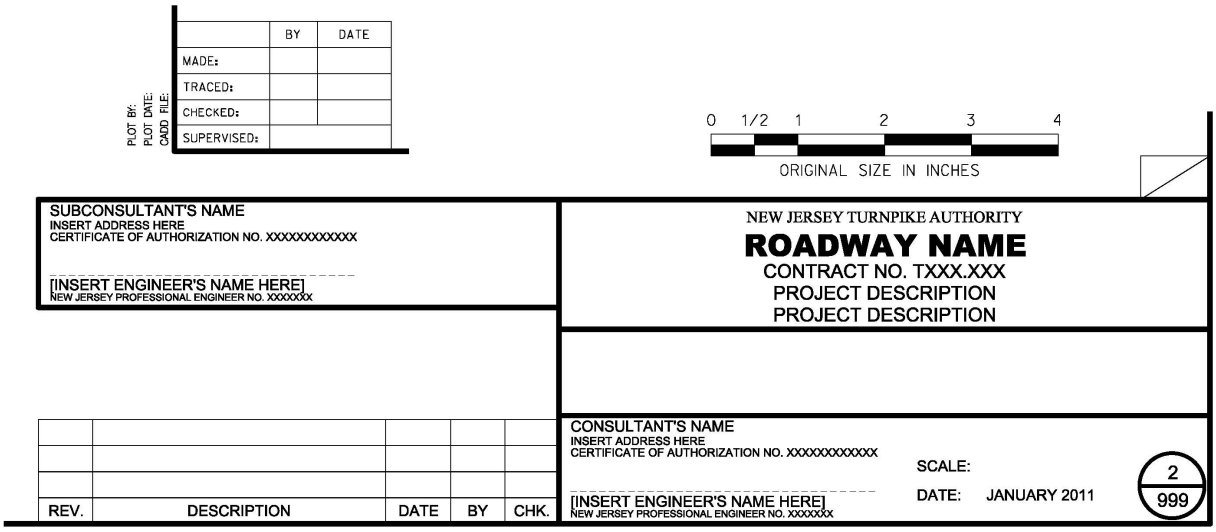


EXHIBIT 6A - 2
TYPICAL TITLE BOX



6A.2 PRELIMINARY PLANS

Preliminary plans are to be drawn at a scale of either 1" = 100' or 1" = 200'. The plans are to be presented on maps showing all topography or aerial photomosaics as directed by the Authority's Engineering Department. The work shall be prepared on bond material.

Profiles are to be drawn at a 10 to 1 ratio with the horizontal scale the same as the plan scale. The sizes of the sheets are to be 2 feet wide and are to be between 3 and 6 feet long.

The following information is to be shown:

6A.2.1 Preliminary Plan Sheets

1. Title box
2. Roadway designations and outside roadway widths
3. Radii with PC, PT and PCC locations
4. Stationing at 100 foot intervals and mileposts
5. Approximate proposed right of way and existing property lines
6. Slope lines
7. Local street names
8. Municipal boundaries and names
9. Horizontal limits of work
10. Typical sections
11. Structure outlines

12. Approximate retaining wall locations
13. Limits of local road relocations
14. Major stream relocations
15. Major utility relocations
16. Major bodies of water
17. Parks

6A.2.2 Preliminary Profile Sheets

1. Title box
2. Roadway designations
3. Existing ground using a dashed line
4. Datum, horizontal and vertical scales and stationing
5. Gradients to nearest 0.1 percent using a solid line
6. Existing and proposed structure locations and major waterway openings
7. Existing subsurface utilities to the extent known
8. Minimum vertical clearances at structures
9. Vertical Curve data including PVI, PVC, PVT, curve length, low/high points, e and K values
10. Location and size of horizontal radii
11. Superelevation and transition locations
12. Superimposed profiles from adjacent ramps or roadways at noses or concentric areas
13. Nose locations

6A.3 PHASE "A" PLANS

Phase "A" plans are to be either 1"=30' or 1"= 50' scale showing existing topography and depicting the entire project, plus 500 feet beyond the proposed longitudinal limit of work.

The following information shall be included with Phase "A" Submission documents:

6A.3.1 Phase "A" Plan Sheets

1. Title box.
2. Base maps to be topographic maps showing as much of the surrounding area as possible.
3. Proposed roadway designations.
4. Typical roadway widths and transition widths.
5. Stationing, station equations, baseline and profile line designations
6. Radii with PC, PT and PCC callouts.
7. Pavement cross slopes, maximum superelevation and location.
8. Slope lines, dashed.
9. Proposed right of way with set dimensions and existing property lines, as well as all easements required for construction, drainage, utilities and slopes.

10. Typical sections showing horizontal dimensions, pavement make-up, curb and sidewalk types, guard rail treatment, pavement cross slopes, right of way dimensions where applicable, grading criteria, superelevation treatment, and profile line for all roadways in contract.
11. Environmental considerations such as earth berms, walls, detention basins, etc.
12. Horizontal limits of work.
13. Approximate location of all utilities and their proposed treatment.
14. Alternatives considered and presented in detail similar to recommended alignment.
15. Construction Sequence at either 1" = 100' or 1" = 200' scale showing existing roadways, proposed roadways and brief explanation of construction sequence, including detours.
16. Temporary and permanent access roads.

6A.3.2 Phase "A" Profile Sheets

1. Title box.
2. Base shall be paper material with a 2 foot width and between 3 and 6 feet long as necessary.
3. Scale to be 1" = 50' horizontal and 1" = 5' vertical, showing datum, stationing and roadway designations.
4. Existing ground dashed and profile line solid with gradients to nearest 0.1 percent
5. Vertical curve data including PVI, PVC, PVT, curve length, low/high points, e and K values
6. Location and size of horizontal radii
7. Superelevation, superelevation transitions and design speed
8. Nose locations
9. Superimposed adjacent or concentric roadways and at noses of ramps
10. Existing and proposed utilities
11. Existing and proposed drainage facilities
12. Structures with minimum critical clearance locations

6A.4 CONTRACT PLAN FORMAT (PHASES "B" THROUGH "D")

Contract drawings shall be numbered consecutively and in the following order:

1. Title Sheet
2. General Legend Sheet
3. Table of Quantities

4. Plan Reference & Boring Location Sheet
5. Tie Sheet
6. Alignment Data Sheet
7. Maintenance and Protection of Traffic Plans
8. Detour Plans
9. Jurisdictional Limit Map
10. Typical Sections
11. Construction Plans
12. Utility Construction Plans
13. Drainage and Grading Plans
14. Drainage Tabulation Sheets
15. Soil Erosion and Sediment Control Plans
16. Landscape Plans
17. Profiles
18. Signing and Striping Plans
19. Lighting Plans (see Design Manual Section 7 Lighting and Power Distribution Systems)
20. ITS Plans (see Design Manual Section 8 ITS and Communication Systems)
21. Construction Details
22. Key to Cross Sections & Earthwork Summary
23. Cross Sections
24. Structural Plans
25. Standard Drawings
26. Reference Drawings

6A.5 CONTRACT PLAN CONTENT (PHASES "B" THROUGH "D")

The following is a brief description of the information to be shown on the finalized contract drawings:

6A.5.1 Title Sheet

1. Title of Project, Contract Number, Authority Commissioners, Location.
2. Location Plan at suitable scale to adequately locate the project.
3. Index of Sheets in upper right-hand corner. Nomenclature on Index of Sheets shall match the nomenclature on Title Box of the drawings.
4. Signature lines in lower right-hand corner; all final mylar Title Sheets must be signed by the Engineer's project manager or a principal officer. In some instances, as directed by the Authority's project

manager, the final mylar Title Sheet may also be signed by the Authority's project manager.

5. Standard Drawings used in this contract in upper left-hand corner. If necessary, the list of Standard Drawings can be put on a separate sheet.
6. Reference Drawings from other contracts which are applicable to this contract along the left sheet edge. If necessary, the list of Reference Drawings can be put on a separate sheet.
7. Utility companies associated with this contract in the lower left-hand corner.

6A.5.2 General Legend Sheet

1. Title box.
2. Standard Authority legend with special symbols for this contract - left side of sheet.
3. General Notes - right side of sheet.
4. Earthwork Summary either here or on first Grading Plan. If cross-sections are used, Summary to be on Key to Cross Sections. See Key to Cross Section description for Summary content and format.

6A.5.3 Table of Quantities

1. Title box.
2. Column headings of Item Number, Authority Standard Item Number, Item Description, unit of measurement, Estimated Quantity From The Plans, If and Where Directed Quantity, Total Contract Quantity and As-Built Quantity.
3. Item descriptions to be completely spelled out, no abbreviations.
4. Items to be consecutively numbered and in the same order as they appear in the Specifications.

6A.5.4 Plan Reference & Boring Location Sheet

1. Title box.
2. North arrow with sheet arranged so that the north arrow generally faces toward the top and/or right side of the sheet.
3. 1"=100' or 1"=200' scale plans showing existing and proposed roadways with designations.
4. Baselines with stationing every 100 feet and labeling at every 500 foot station.
5. Plan sheet outlines with separate plan sheet numbers shown, starting with Sheet 1. These will not be drawing numbers in the contract set, but will reference to the plan sheets within separate groups of plans.
6. Borings with identification.

7. Show project limits and contract limits.
8. If used as baseline tie sheet also, give traverse bearings and distances from PI to PI; offset from traverse to proposed baseline, if 90 degrees give distance from PI to offset point; if not, give bearing and distance. Clearly identify baseline point being tied down.

6A.5.5 Tie Sheet

1. Title box.
2. Field ties of traverse points shown on Plan Reference Sheet.
3. Label all points, including a description, such as rebar, stake, nail, etc.
4. Tie to be of size to be easily read and located. Need not be to scale.
5. Coordinates of all points and bearings and distances between points if these cannot be clearly shown on Plan Reference Sheet.
6. Sketches orientated to north arrow to aid in locating points.
7. Bench Mark elevations and descriptions.
8. State Plane Coordinate System.

6A.5.6 Alignment Data Sheet

Tabulation to show the following information for all survey baseline data, alignment data and alignment curves in the contract.

1. Title box.
2. Survey Baseline Data including point number; bearing, to nearest 0.1 ***second***; station, to nearest 0.01 foot; coordinates, to nearest 0.001 foot; and elevations, to nearest 0.01 foot.
3. Alignment Data including point type and station, to nearest 0.01 foot; station and offset to survey baseline, to nearest 0.01 foot; and coordinates, to the nearest 0.001 foot.
4. Curve Data including curve number (assign letter prefix to appropriate baseline if necessary), delta angle (Δ), to nearest 0.1 foot, radius (R), tangent (T) and arc (L) lengths, to nearest 0.01 foot; Center of Curve and PI coordinates, to the nearest 0.001 foot; and Plan Sheet number(s) on which the curve is found.

6A.5.7 Maintenance and Protection of Traffic Plans

1. Title box.
2. North arrow with sheet arranged so that the north arrow generally faces toward the top and/or right side of the sheet.
3. 1”=100’ or 1”=200’ scale plans showing existing and proposed roadways with designations.
4. Clearly show work to be performed in each Stage. Work may be subdivided into more detailed Phases for clarity, for maintenance of

traffic, or for reasons particular to the contract (such as earthwork balance or other special situations).

5. If more than one Stage is used, succeeding Stages shall show work constructed under previous Stage. Shading can be used to indicate various stages of construction.
6. Show traffic pattern during the various Stages and Phases, including construction signing.
7. Written description of work to be performed including when and how traffic patterns are changed. Include notes indicating duration limits if critical to the project.
8. Contract limits and adjacent or overlapping contracts.
9. Identify areas where contract coordination is required, if applicable.

6A.5.8 Detour Plans

Detour Plans are required when traffic is routed over temporary roadways or existing roadways temporarily. Detours that involve Authority roadways and ramps must be reviewed and approved by the appropriate Authority Operations Department. Detours that involve local roads must be reviewed and approved by the appropriate agency(s) with jurisdiction. ***For detours involving roadway closures of non-State highways not under Authority jurisdiction in excess of 48 hours, formal State approval with local county and/or municipality resolution is required.*** The following information is to be shown:

1. Title box.
2. North arrow with sheet arranged so that the north arrow generally faces toward the top and/or right side of the sheet.
3. Complete computed horizontal and vertical alignment. The vertical alignment may be shown either as described in Subsection 6A.5.17 or by showing spot elevations at 25-foot station intervals.
4. The highway or grading plan sheets can be used as a base. Show existing and proposed roadways in the area and clearly show what roadways the detour will connect. Existing regulatory signs and traffic signals shall be shown.
5. Scale to be appropriate to show detail necessary for construction.
6. Typical section and pavement if not shown on Typical Section Sheets.
7. Curve data coordinates, bearings and pavement widths.
8. Temporary drainage required.
9. Notes concerning staging.
10. Locations of traffic control devices.
11. Construction, access and/or detour roads will not cross any waterways without prior approval of the agency having jurisdiction.

Provision for protecting waterways is to be covered either in the plans with details or by requiring the contractor to provide details.

12. Traffic stripes.
13. If necessary, state that Uniformed Police Directors will be required.

6A.5.9 Jurisdictional Limit Map

Jurisdictional Limit Maps may be necessary if a project overlaps an area outside of the Authority's Right-of-Way, such as at an interchange, and future maintenance responsibilities must be specified and agreed upon. While sometimes Jurisdictional Limit Maps are included in a set of bidding plans, they are typically a separate document, and they are only to be prepared at the express direction of the Authority.

1. Title box.
2. North arrow with sheet arranged so that the north arrow generally faces toward the top and / or right side of the sheet.
3. 1" = 100' (or 1" = 200' if approved by the Authority's Engineering Department) scale plans showing the completed construction in accordance with the symbols shown in Standard Legend. No contours are to be shown on Jurisdictional Limit Maps.
4. Names of roadways.
5. Show proposed baselines, and indicate and label 100 foot Stations.
6. Show final Right-of-Way and property lines.
7. Include a legend of shading to indicate under who's jurisdiction various areas and appurtenances will be maintained by.
8. Shade in the appropriate areas to indicate under who's jurisdiction various areas and appurtenances will be maintained by.
9. In addition to shading, it may be necessary to include notes to clarify jurisdictional issues, such as snow plowing.
10. Label match lines by station and matching plan sheet number.

6A.5.10 Typical Sections

11. Title box.
12. Scale shall adequately show all typical section details.
13. Detail various existing and proposed pavement sections and details.
14. Show existing and proposed typical lane, shoulder and berm dimensions and cross slopes for all roadways.
15. Show typical grading criteria and median grading treatments.
16. For mainline roadways and ramps, show normal and superelevated sections.
17. Show special sections such as pavement widening details.

18. Show special earthwork details such as method of determining lateral limits of muck excavation - designate pay limits.
19. Show topsoil, seeding, berm surfacing and guide rail locations.
20. Show pavement details for access roads, parking lots, etc.
21. Show rock cut details and pay limits, if applicable.
22. Show typical locations for curb, lip curb, barrier curb, medians, underdrains, inlets and manholes, if applicable.
23. Show acceleration and deceleration lane treatments.
24. For mainline roadways and ramps, show existing and proposed right of way lines.
25. For all local roads, show overall right of way dimensions.

6A.5.11 Construction Plans

1. Title box.
2. North arrow with sheet arranged so that the north arrow generally faces toward the top and/or right side of the sheet.
3. 1"=30' (or 1"=50' if approved by the Authority's Engineering Department) scale plans showing existing planimetry in accordance with symbols shown in Standard Legend. No contours are to be shown on Construction Plans.
4. Show 500 feet of planimetric coverage beyond the beginning and end of the contract.
5. Existing drainage shall be indicated including inverts and types of drains. Existing streams, brooks, ditches, etc. are to be indicated including direction of flow and name of waterway (local name in parenthesis if applicable).
6. Existing roadways showing name and type of pavement and dimensions.
7. Horizontal alignment showing typical roadway dimensions at each edge of the sheet for each roadway shown, including dimensions needed to define transition areas.
8. Curve numbers shown, PC, PT, FCC stations shown, ties (station and offset) at beginning and end of variable pavement sections. Station in direction of traffic on single direction roadways.
9. Show baseline (existing and proposed), proposed right of way lines, bearings and station equations, indicate and label 100 foot stations.
10. Show all proposed and existing right of way lines, existing property lines, easements, etc. outside proposed right of way.
11. Pavement, curb, sidewalk, guide rail and approach slabs. Give limits of various pavement types.
12. Show borings by symbol and boring number.

13. Using Standard Legend, show existing and proposed utilities, treatment of existing utilities, if utility work by others, indicate by whom (Public Service, NJ American Water, etc.) and show Utility Work Order Number.
14. Show both existing and proposed overhead and underground power, telephone and communication wires.
15. Show baseline and ROW monuments by using Standard Legend symbols. Baseline monuments are to be placed at all PC, PCC's, PT's, etc. and at other locations to provide a maximum spacing of 500 feet. Right of way monuments are to be placed every 1,000 feet and at angle points in the proposed right of way line that do not coincide with existing property lines. Stations and offsets to right of way monuments to nearest 0.01 foot clearly showing the baseline to which monuments are referenced. Each baseline monument to have coordinates to nearest 0.01 foot.
16. Show type and location of proposed fence and type and location of vehicular gates, if applicable.
17. Label match lines by station and matching Plan sheet number.
18. If detours are involved, reference to detour sheet to be shown on appropriate plan sheet.
19. For special treatments, make cross reference to appropriate sheets.
20. If applicable, show horizontal limits of muck excavation, overload, sand drains, etc.

6A.5.12 Utility Construction Plans

Utility Construction Plans are to be introduced into a contract where complex and/or extensive utility work is to be done within the contract limits and the work cannot be adequately shown on the Plans.

Generally, this condition will most usually occur in the Toll Plaza areas, but the use of these sheets is not restricted to those areas.

Profiles will be required for complicated or unusual utility installations such as extra depth water mains, sanitary sewers with tight clearances, etc. The format is to be similar to that of the roadway profiles described under Subsection 6A.5.17.

If this work is to be done by the Contractor, clearly specify if the materials will be furnished by the Contractor or the utility. If inspections are to be performed by the utility, specify the lead time required to schedule said inspection, and the appropriate contact person information.

The Utility Construction Plans shall show all utility work to be performed, whether by the Contractor or by various utility companies. The following information is to be shown:

1. Title box.

2. North arrow with sheet arranged so that the north arrow generally faces toward the top and/or right side of the sheet.
3. Scale to be no smaller than 1" = 30'.
4. Existing topography and proposed items of construction.
5. Existing and proposed utilities, both underground and aerial, including main lines and service connections. All utilities shown in accordance with the Standard Legend.
6. Work to be performed by a Utility Company is to be noted by Utility Work Order Number and the name of the Company.
7. Show schedule of conduits as to size, location, use, when to be installed, and who does the work.
8. Utility installation details.
9. List of Utility Companies and their responsibility, e.g. "Primary Electric Service - Public Service Electric and Gas Co."
10. Coordination required with other contracts, or responsibility clearly defined if contract limits overlap.

6A.5.13 Drainage and Grading Plans

Although cross sections are required, contouring may still be required to show intent for areas such as interchange infield grading, grading at ramp merges, water quality basins, etc.

1. Title box.
2. North arrow with sheet arranged so that the north arrow generally faces toward the top and/or right side of the sheet.
3. Drainage and Grading Plans shall be to the same scale (1"=30' or 1"=50') and cover the same area as the Construction Plans.
4. The title of the sheet shall contain a number that is to be the same as the Plan sheet number, i.e. Construction Plan No. 10 covers the same area as Drainage and Grading Plan 10.
5. Same planimetry as shown on the Construction Plan sheets with the addition of 1-foot existing contour lines.
6. Existing and proposed utilities in accordance with Standard Legend.
7. Proposed and existing roadways with proper designations.
8. Stationing, bearings, PC, PT and PCC's labeled, 100 foot stations labeled, right of way shown and labeled.
9. All existing and proposed drainage with flow arrows. Drafting to differentiate features by using Standard Legend symbols for inlets, manholes, etc. Show all inverts, grate elevations, pipe sizes and lengths for existing and proposed, ditches (type), rip—rap, type of existing and proposed pipe and length of proposed pipe between structures (inlets, manholes, etc.), underdrains.
10. All roadway and shoulder cross slopes.

11. Spot elevations at 25-foot intervals in areas where grades deviate from typical sections.
12. In areas involving complicated drainage patterns or grading, where showing pipe sizes, lengths and elevations would tend to clutter the plans, Drainage and Grading Plans may be separated or Drainage Tabulation Sheets may be used, but only with Authority's Engineering Department approval. With the use of Drainage Tabulation Sheets, all drainage structures, flared end sections, headwalls, etc. are to be assigned structure numbers for cross-referencing the Drainage and Grading Plans and Drainage Tabulation Sheets.
13. Generally, if cross sections are not included in the contract plans, one-foot contours are to be shown for all pavement and slope areas. However, for relatively flat pavement areas, contours at 0.1, 0.2 or 0.5-foot intervals may be required to adequately define the pavement surface. For uniformly graded slopes, only the 5-foot contours need be shown. One-foot contours are required in variable areas, flat areas and for meeting existing contours.
14. Muck Excavation, overload, sand drain, etc. limits shown with appropriate symbols and labeled.
15. Earthwork Summary on first Grading Plan if not shown on Key to Cross Sections sheet. For contracts with cross sections, Summary to be on Key to Cross Sections - See Key to Cross Sections description for Summary content.

In an effort to keep the pavements properly drained, the Authority prefers to provide a swale at pavement gore areas. This swale is graded to intercept sheet flow across the pavement gore areas, either ramp or mainline, and direct the water towards the physical nose. Inlets are installed at the physical nose to collect this water.

The following should be shown when pavement gores areas are included:

1. Spot elevations at 25-foot intervals for edges of thru pavement adjacent to gore areas.
2. Spot elevations and horizontal location of swale.

6A.5.14 Drainage Tabulation Sheets

Drainage Tabulation Sheets are to be used only when the showing of inverts, pipe sizes and lengths, inlet types, etc. on the Drainage and Grading Plans would produce a cluttered and illegible sheet and then only with Authority's Engineering Department approval. If used, Drainage Tabulation Sheets are to be prepared for each Drainage and Grading Plan. The Tabulation is to show the following:

1. Title box.
2. Drainage structure number conforming to number shown on the Grading Plans.
3. Baseline station and offset.

4. Invert and top of grate elevations.
5. Type of structure i.e., Inlet Type D-1, Manhole Type M-1, etc.
6. Flared end sections with size and number of each.
7. Size, length and type of pipe between drainage structures.
8. A column for remarks.
9. The above are to be the column headings on the sheet, which will then allow the various entries to be tabulated in the appropriate columns.
10. The bottom line is to be headed “Sheet Totals” for totaling the various items of work. The final Tabulation sheet shall have a “Contract Totals” line for summarizing the item totals for the contract.

6A.5.15 Soil Erosion and Sediment Control Plans

1. Title box.
2. North arrow with sheet arranged so that the north arrow generally faces toward the top and/or right side of the sheet.
3. Erosion control devices

6A.5.16 Landscape Plans

For Landscape Plans format and content, see Section 10 (Landscaping) of the Design Manual.

6A.5.17 Profiles

Profiles are required for all roadways and are required for major underground utility relocations. Profile coverage shall extend 500 feet beyond the contract limits.

1. Title box.
2. Existing ground shown in dashed line and labeled.
3. Proposed profile grade shown in solid line and labeled, e.g. “P.G.L. Ramp ST”. Gradients shown to nearest 0.01 percent with a + or - to indicate rising or falling grade with respect to direction of increasing stationing.
4. 50-foot horizontal and five-foot vertical scales. Show 100-foot stations and datum elevation.
5. At every 50 feet of stationing, show vertical risers to stop, at either existing ground or profile line, whichever is higher.
6. Give proposed pavement elevations to nearest 0.01 foot and existing pavement elevations to nearest 0.1 foot at 50-foot intervals. In transition areas, give all variable edge elevations. Elevations to be written parallel to vertical risers with proposed to the right and existing to the left.
7. Clearly label profile with roadway designation.
8. Show PVI, PVC, PVT, curve length, low/high points, e and K values

9. Show structure either on profile or graphically above PGL. If on profile show footings.
10. If applicable, show pay limits of muck excavation and approximate elevation of firm bottom. Show upper limit of muck excavation backfill.
11. Show all drainage and utilities greater than 36" in diameter crossing the profile line by graphical plot, and identify utility and label size of pipe. Show major drainage parallel to roadway if critical.
12. Show station equations.
13. Across the top of the of the plan sheet, indicate the horizontal geometry as to whether the alignment is tangent, curved right, curved left, the PC, PCC and PT locations, and the curve radius.
14. Across the top of the plan sheet, indicate if the profile has a normal crown, or if it is superelevated right or left. Show the stations where superelvation transitions occur

6A.5.18 Signing and Striping Plans

For Signing and Striping Plans format and content, see Sections 6A and 6B (Signing and Striping) of the Design Manual.

6A.5.19 Lighting Plans

For Lighting Plans format and content, see Section 7 (Lighting and Power Distribution Systems) of the Design Manual.

6A.5.20 ITS Plans

For ITS Plans format and content, see Section 8 (ITS and Communications Systems) of the Design Manual.

6A.5.21 Construction Details

The construction details are to cover any items of construction not covered in the Standard Drawings. The drawings may have several scales and the scale for a particular detail shall be chosen so that the work can be clearly shown. Details are to include the following:

1. Title box.
2. Clearly defined pay limits and the work covered in the pay item.
3. Type of materials to be used and their location.
4. Typical, plan, elevation and section details as required.
5. Designations conforming to pay items in the proposal.
6. Appropriate notes concerning details, methods of construction, and location.

6A.5.22 Key to Cross Sections & Earthwork Summary

The purpose of the Key to Cross Section sheet(s) is to show where the cross sections were taken, what baselines were used and the location of cross section match lines. The following should be shown:

1. Title box.
2. Scale either 1"=100' or 1"=200'.
3. Existing and proposed roadways with right of way lines and roadway designations.
4. Baselines used for cross sections with stations labeled every 500 feet.
5. Location of individual Cross Section sheet limits shown.
6. Cross Section match lines clearly shown and labeled.
7. Legend for cross sections as follows:

C	= Excavation	- Sq. Ft.
F	= Embankment	- Sq. Ft.
SF	= Stripping in Fill	- Lin. Ft.
SC	= Stripping in Cut	- Lin. Ft.
CE	= Channel Excavation	- Sq. Ft.
ME	= Unsuitable or muck excavation	- Sq. Ft.
P	= Porous Fill	- Sq. Ft.
TS	= Topsoil	- Lin. Ft.

8. Earthwork Summary

On contracts involving earthwork, an Earthwork Summary is to be shown in the plans. For contracts with only Grading Plans, the Summary is to be shown on the first Grading Plan. For contracts with cross sections, the Summary shall be shown on the first Key to Cross Section sheet. The Summary shall contain at least the following:

Excavation

a. Roadway Excavation from cross sections and/or grading plans.
b. Deductions for stripping, pavement excavation, etc.
c. Additional quantities for topsoiling.
d. Show total volume Roadway Excavation Earth.
e. List other excavation quantities, such as channel excavation, muck excavation, rock excavation, etc.

Embankment

a. Embankment from cross sections and/or grading plans.
b. Deduct volumes for topsoil.
c. Add volumes for stripping, pavement excavation in fill areas, etc.
d. Show embankment required.
e. List other embankment quantities, such as Grade A, Grade B, porous fill, etc.

Summary

a. Show mathematical difference between the excavation and embankment.

b. Indicate whether the contract is a surplus or borrow job.

6A.5.23 Cross Sections

Cross sections are to be included in the contract plans unless otherwise directed by the Authority's Engineering Department. The format and data required for cross sections is to be as follows:

1. Title box.
2. Sheets to be same size as Plan Sheets with a 1" base grid and 10 divisions per inch. Sheets are to have the same border dimensions as the plan sheets.
3. The title and revision boxes are to be in the lower right hand corner, with no grid in this area.
4. The horizontal and vertical scales are to be 1"=10'.
5. The title box is to give the roadway designation and station to station limits for the sections that appear on the individual sheets.
6. All earthwork from original ground to final grading or template lines.
7. All structures and retaining walls, including their footings.
8. At profile line, show existing and proposed elevations.
9. Limits of muck excavation and limits of Special Subgrade Material, Grade B backfill.
10. Limits of channel excavation for channels or ditches, which may be parallel to the roadway, but far enough removed from the normal roadway work area not to be considered as roadway excavation.
11. Separate sections for major drainage channels, which would not ordinarily be shown on Roadway Cross Sections.
12. Stripping limits for cut and fill conditions.
13. Continuous Cross Section baseline for each sheet, i.e. no offsets or jogs. Station for each section.
14. Section quantities tabulation, preferably on right side of sheet next to the section.
15. Section match lines indicated.
16. Cross sections are to be shown at 50-foot intervals.

6A.5.24 Structural Plans

For Structural Plans and Details format and content, see Section 6B of this Manual.

6A.5.25 Standard Drawings

The Authority's Standard Drawings required for each contract will be furnished by the Authority's Engineering Department. Absolutely no changes or additions of any kind are to be made to the Standard Drawings.

Any New Jersey Department of Transportation Standard Drawings needed for a project must be both obtained and numbered by the Engineer.

Each Standard Drawing which is to be included in the plans will be given a number, and an individual original copy of each Standard Drawing will be included in each original set of contract drawings. The Standard Drawings will be numbered starting with the first number after the last construction contract drawing. They are to be listed alphabetically, according to Standard Drawing title, when arranged for assignment of sheet number.

In the margin directly under the Standard Drawing title box, space is provided to fill in the contract number, the individual sheet number and the total number of sheets in the contract. It will be the Engineer's responsibility to give the Authority's Engineering Department ample notification of which Standard Drawings will be required for each contract, so that the Authority's Engineering Department will have time to prepare original copies of the necessary drawings.

6A.5.26 Reference Drawings

Reference Drawings are any sheets, which will aid the Contractor, whether they are from a previous contract, a concurrent contract or from a future contract. Absolutely no changes are to be made to any reference drawings.

Following the list of Standard Drawings, a separate listing is to be shown on the title sheet of Reference Drawings. These Reference Drawings will also receive a sheet number and become part of the contract. They will receive sheet numbers after the last Standard Drawing number has been assigned. All boring logs are to be included as Reference Drawings and are to appear in the contract at the very end of the "Reference Drawings". All reference drawings are to have the words "Reference Drawing" inked immediately adjacent to the title box with lettering to have a base height of equal to 0.35 feet. In the margin below the title box, the contract number, individual sheet number and total number of sheets in the contract are to be added.

If Reference Drawings are required from another contract prepared by the same Engineer, it will be their responsibility to furnish reproduced original copies of such drawings for all contracts to which they apply.

Should the Reference Drawings be from a contract prepared by another Engineer, the Authority's Engineering Department will furnish reproduced original copies of such drawings, provided the Engineer has advised the contract number(s) and sheet description(s) that are required. It will be the Engineer's responsibility to give the Authority's Engineering Department ample notification of which Reference Drawings will be

required for each contract so that the Authority's Engineering Department will have time to prepare copies of such sheets.

Thus, there will be three basic divisions to any set of construction contract drawings. The first division will be the construction drawings prepared for the individual contract. The second division will include all of the Standard Drawings applicable to that particular contract, arranged in alphabetical sequence and given sheet numbers. The third division will include all Reference Drawings, including the boring logs. All of the sheets of the various divisions will be given sheet numbers in numerical order starting with Sheet No. 1 of the construction plans and ending with that number which constitutes the last of the Reference Drawings. There shall be a complete set of original or reproduced original drawings for each construction contract.

6A.6 LOCAL ROAD SIGNING AND PAVEMENT MARKING

These drawings should apply only to signing and pavement marking for local roads, which are relocated, widened, extended or affected as part of an Authority contract and shall be included in the Contract Signing and Striping Plans. For signing and striping, see Section 6A and 6B (Signing and Striping) of the Design Manual.

1. Maintenance and Protection of Local Road Traffic:

   Maintenance and protection of local road traffic shall be provided in accordance with the procedures set forth in the "Manual on Uniform Traffic Control Devices for Streets and Highways" (MUTCD) as published by the Federal Highway Administration. The details for this maintenance and protection of local road traffic need not be shown on the plans if the contract documents can refer to the MUTCD for the pertinent requirements. If not, then appropriate details shall included in the plans. If necessary, state that Uniformed Police Directors will be required. The Supplementary Specifications shall describe the work required and a lump sum item shall be provided in the Proposal to cover the cost of this work.

2. Permanent Construction of Traffic Control Devices on Local Roads:

   Where local roads are relocated and/or reconstructed, it will generally become necessary to replace the existing traffic control devices and perhaps install new devices, including pavement striping where applicable.

   The New Jersey Department of Transportation, Bureau of Traffic Engineering, exercises significant control over signing and pavement marking on both county and local roads; that intersect or are operationally influenced by a State highway; and related items installed under Authority contracts will require Department approval. Such Department approval, together with their subsequent inspection after installation, legalizes the signing and pavement marking. This legalization is essential for the protection of the Authority. For traffic control devices on a local road that impacts State highways, procedures pursuant to the provisions of N.J.A.C.16:27-4.2(c) shall be followed.

For each instance involving local road traffic control devices, the Engineer is to contact the municipal and county engineers to determine who is responsible for such installations and who submits them for approval by the Department. In most cases, it will be found that local municipality and/or county resolutions are a necessary part of the submittal.

Submittals to the Department for approval are always made by either the municipality or county.

Following the Engineer's design of the traffic control devices, the layouts are to be submitted to the local agency having jurisdiction for review and comments. The agency should be asked at that time about the legal status of all existing traffic control devices, which are proposed for replacement. If it cannot be absolutely determined that an existing device has been previously legalized by the Department, it is to be assumed that it is not legal and that traffic control device shall be included with those being submitted to the Department for approval. In some cases, it may be more convenient to seek approval of all traffic control devices for a particular area, whether previously approved or not, especially if they are all shown on the same layout. Under no circumstances can existing illegal traffic control devices be reinstalled by the Authority's Engineering Department without prior approval by the Department.

Care should be taken during design to avoid including control devices which are not needed and which would not ordinarily be installed by a local agency, since approval of all devices involves a perpetual responsibility for maintenance of these facilities, including regular repainting of pavement markings.

Every effort should be made to combine as many traffic control installations within a common jurisdiction agency as possible in order to minimize the required number of resolutions and submittals to the Department.

After the local agency has agreed to the proposed layout, the Engineer is responsible for assisting the local agency in the preparation of the submittal wherever possible by providing necessary plans, reports, etc.

Department approval and an adopted resolution must be obtained before the Authority can finalize the contract.